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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,155	08/29/2001	Ravindra K. Shetty	H00-02102 (256.100US1)	6813

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EXAMINER

HOLMES, MICHAEL B

ART UNIT PAPER NUMBER

2121

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/942,155

Applicant(s)

SHETTY ET AL.

Examiner

Michael B. Holmes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-72 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 11, 19-22, 28, 35-38, 44, 51-53 & 57 is/are rejected.
- 7) ☒ Claim(s) 6-10, 12-18, 23-27, 29-34, 39-43, 45-50, 54-56 and 58-72 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>07012002/05242004</u> . | 6) <input type="checkbox"/> Other: _____ |



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Examiner's Detailed Office Action

1. This Office Action is responsive to application **09/942,155**, filed **August 29, 2001**.
2. **Claims 1-72** have been examined.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 11, 19-22, 28, 35-38, 44, 51-53 & 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Agrafiotis et al. (USPN 6,421,612 B1) further in view of *Guiver et al.* (USPN 5,809,490).

Regarding claim 1. *Agrafiotis et al.* describes a computer-implemented method for supervised artificial neural network machine learning (FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35), comprising: a storage device (FIG. 19, C 36, L 18-49); an output device (FIG. 19, C 36, L 18-38

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& C 38, L 22-29); a processor programmed to repeatedly perform a method (C 5, L 12-19 & C 17, L 51 to C 18, L 09); receiving data (FIG. 8 & FIG. 11, C 12, L 31-57); checking dimensionality of the received data (FIG. 8 & FIG. 11, C 12, L 31-57); reducing the dimensionality of the received data to enhance machine learning performance based on the dimensionality (FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35); specifying the supervised neural network architecture (FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35); initializing weights to establish connection strengths between the received data and predicted values (FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35, *typically training an artificial neural network refers to the process of setting or initializing the connection weights so that the artificial neural network produces a desired output in response to particular inputs.*); performing supervised machine learning using the specified architecture, initialized weights, and the received data including the reduced dimensionality to predict values (FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35 & C 17, L 41 to C 18, L 10); and revising the initialized weights of the network based on a normalized system error threshold value to generate a learnt neural network having a reduced error in weight space. (FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35 & C 32, L 29) *Agrafiotis et al.* does not describe a sparse data environment or analyzer. However, *Guiver et al.* describes sparse data environment (C 9, L 10-16) and analyzer (C 1, L 13-25). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matters to combine *Agrafiotis et al.* with *Guiver et al.* because in a number of system modeling applications where first principles, analytical, or expert knowledge about the actual structure of the system to be modeled is lacking or inadequate, data driven analyzers may be applied in place of conventional analyzers. These data driven analyzers may incorporate a number of models such as parametric

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statistical models, non-parametric statistical models, clustering models, nearest neighbor models, regression methods, and engineered (artificial) neural networks. (C 1, L 13-21)

Regarding claim 2, 20, 36 & 53. data selected from the group consisting of static data (*Agrafiotis et al.*, C 6, L 66-67) and real-time data (*Guiver et al.*, C 11, L 18)

Regarding claim 3, 4, 21 & 37. reducing the dimensionality of the received data to enhance machine learning performance based on the dimensionality, further comprises: receiving data (*Agrafiotis et al.*, FIG. 8 & FIG. 11, C 12, L 31-57); checking dimensionality of the received data (*Agrafiotis et al.*, FIG. 8 & FIG. 11, C 12, L 31-57); and reducing the dimensionality of the received data to enhance machine learning performance based on the outcome of the checking. (*Agrafiotis et al.*, FIG. 8 & FIG. 11, C 15, L 49 to C 16, L 35)

Regarding claim 11, 28 & 44. The method of claim 2, wherein initializing the weights further comprises: initializing the weights using random weights. (*agrafiotis et al.*, C 17, L 19-40)

5. Claims 5, 22, 38, 52 & 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Agrafiotis et al.* (USPN 6,421,612 B1) further in view of *Guiver et al.* (USPN 5,809,490) further in view of *Delanoy* (USPN 5,793,888).

Regarding claim 5, 22, 38 & 57. reducing the dimensionality of the received data comprises; reducing the number of attributes in the received data using Principal Component Analysis.

(*Delanoy*, C 14, L 22-34) It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matters to combine *Agrafiotis et al.* with *Guiver et al.* with *Delanoy* because there is a growing problem in that the vast image databases being accumulated today are overwhelming the capabilities of users to find particular images e.g., much of the data currently obtained from military and civilian sensors is recorded and never accessed because of the difficulty of searches. (*Delanoy*, C 1, L 27-32)

Regarding claim 52. The system of claim 51, further comprising: a database coupled to the receive module to receive and store data. (*Delanoy*, C 4, L 55-64) It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matters to combine *Agrafiotis et al.* with *Guiver et al.* with *Delanoy* because there is a growing problem in that the vast image databases being accumulated today are overwhelming the capabilities of users to find particular images e.g., much of the data currently obtained from military and civilian sensors is recorded and never accessed because of the difficulty of searches. (*Delanoy*, C 1, L 27-32)

Claim Objection

5. Claims 6-10, 12-18, 23-27, 29-34, 39-43, 45-50, 54-56 & 58-72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and (listed of form **PTO-892**) not relied upon is considered pertinent to applicant's disclosure as follows. Applicant or applicant's representative is respectfully reminded that in process of patent prosecution i.e., amending of claims in response to a rejection of claims set forth by the Examiner per Title 35 U.S.C. The patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and any objections made. Moreover, applicant or applicant's representative must clearly show how the amendments avoid or overcome such references and objections. *See 37 CFR § 1.111(c).*

Correspondence Information

7. Any inquiries concerning this communication or earlier communications from the examiner should be directed to **Michael B. Holmes** who may be reached via telephone at **(703) 308-6280**. The examiner can normally be reached Monday through Friday between 8:00 a.m. and 5:00 p.m. eastern standard time.

If you need to send the Examiner, a facsimile transmission regarding After Final issues, please send it to **(703) 746-7238**. If you need to send an Official facsimile transmission, please send it to **(703) 746-7239**. If you would like to send a Non-Official (draft) facsimile transmission the fax is **(703) 746-7240**. If any attempts to reach the examiner by telephone are unsuccessful, the **Examiner's Supervisor, Anthony Knight**, may be reached

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at (703) 308-3179.

Any response to this office action should be mailed too:

Director of Patents and Trademarks Washington, D.C. 20231. Hand-delivered responses should be delivered to the Receptionist, located on the fourth floor of **Crystal Park II, 2121 Crystal Drive Arlington, Virginia.**

Michael B. Holmes


Patent Examiner

Artificial Intelligence

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United States Department of Commerce

Patent & Trademark Office



Anthony Knight
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